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Indian Standard
**ACCURACY REQUIREMENTS FOR
DISPENSING PUMPS USED IN
PETROLEUM TRADE**

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**BUREAU OF INDIAN STANDARDS
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002**

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ACCURACY REQUIREMENTS FOR DISPENSING PUMPS USED IN PETROLEUM TRADE

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*Indian Standard***ACCURACY REQUIREMENTS FOR
DISPENSING PUMPS USED IN
PETROLEUM TRADE****0. FOREWORD**

0.1 This Indian Standard was adopted by the Indian Standards Institution on 7 June 1965, after the draft finalized by the Commercial Weights and Measures Sectional Committee has been approved by the Mechanical Engineering Division Council.

0.2 At the instance of the Standing Metric Committee (now the Directorate of Weights and Measures), Government of India, a number of Indian Standards on testing the accuracy of commercial measuring instruments used in petroleum trade are being prepared by this Institution. This standard covers the accuracy requirements and test requirements of dispensing pumps used in petroleum trade. Besides, the series of standards on accuracy of commercial measuring instruments at present comprises the following:

IS:3032-1965 General requirements for testing the accuracy of commercial measuring instruments used in petroleum trade (under print)

IS:2801- Accuracy requirements for bulk meters used in petroleum trade (under preparation)

IS:3047-1965 Accuracy requirements for volumetric container filling machines used in petroleum trade.

0.3 For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test, shall be rounded off in accordance with IS:2-1960*. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

1. SCOPE

1.1 This standard covers the accuracy requirements for dispensing pumps used in petroleum trade.

*Rules for rounding off numerical values (*revised*).

2. TERMINOLOGY

2.0 For the purpose of this standard, the following definitions shall apply.

2.1 Dispensing Pump — A measuring instrument used in conjunction with a storage tank or tanks for dispensing of liquid fuel by volume.

2.2 'Wet-Hose' System — One in which the discharge hose is full of liquid whether the pump is in operation or not.

2.3 'Dry-Hose' System — One in which the discharge hose is completely drained after the discharge is complete and the pump is not in operation.

2.4 Test Measure — A standard measure calibrated to the accuracy of a working standard.

3. TYPES

3.1 Dispensing pumps shall be either of the meter type or container type.

4. GENERAL REQUIREMENTS

4.1 Dispensing pumps shall comply with the general requirements specified in IS : 3032-1965*. In addition, they shall comply with the requirements given in 4.2 to 4.9.2.

4.2 A dispensing pump of the meter type (*see* Fig. 1) shall essentially consist of:

- a) suitable casing or housing,
- b) pumping unit,
- c) metering unit,
- d) register for quantities,
- e) flexible hose with nozzle,
- f) filter, and
- g) air separator.

4.2.1 A dispensing pump of the container type (*see* Fig. 2) shall essentially consist of:

- a) suitable casing or housing,
- b) pumping unit,
- c) volumetric container/containers,
- d) register for quantities,
- e) flexible hose with nozzle, and
- f) filter.

*General requirements for testing the accuracy of commercial measuring instruments used in the petroleum trade (under print).

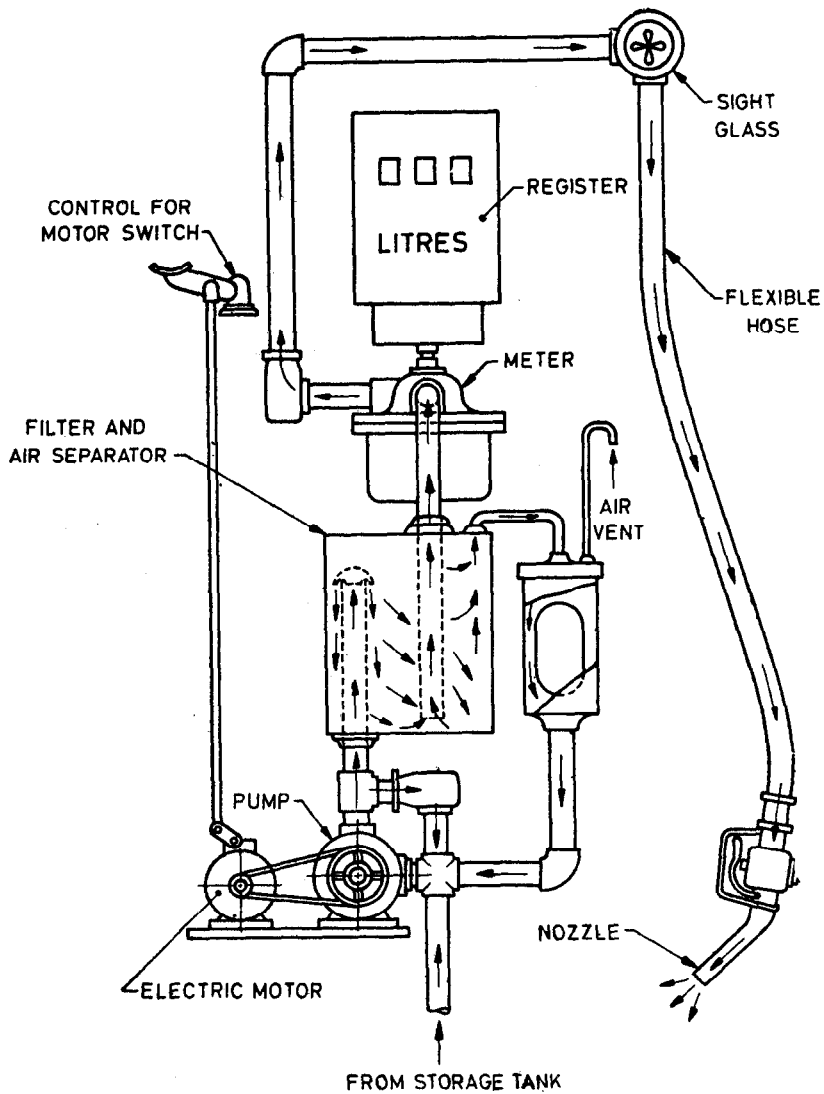


FIG. 1 SCHEMATIC DIAGRAM OF METER TYPE DISPENSING PUMP

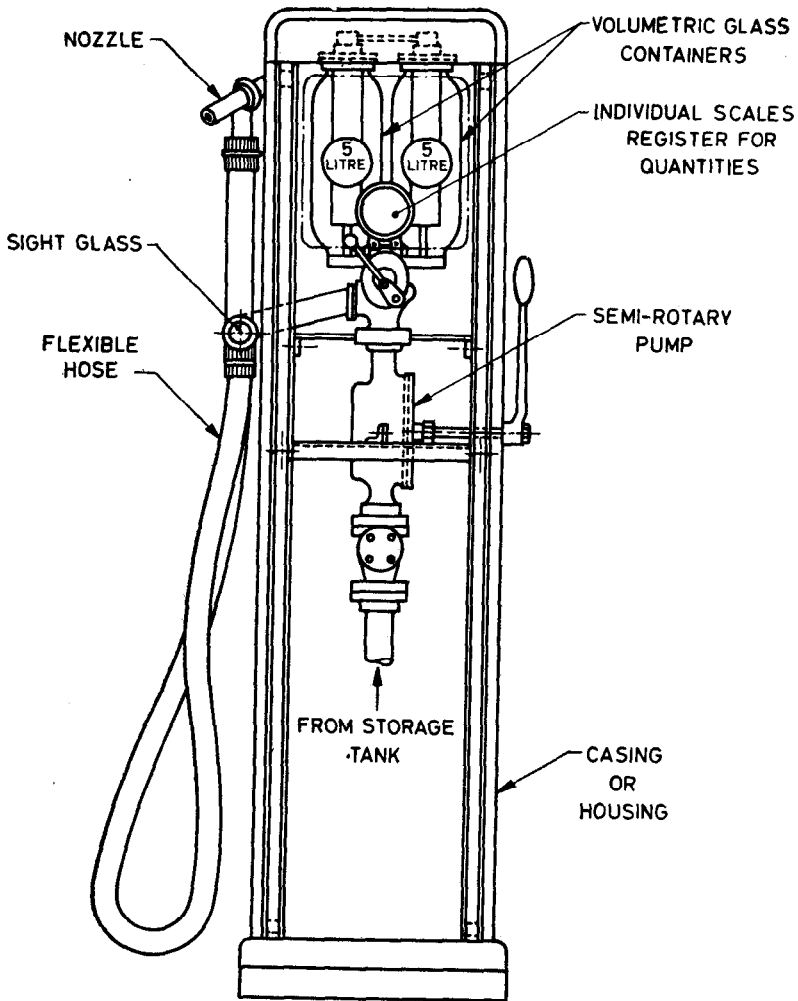


FIG. 2 TYPICAL CONTAINER TYPE DISPENSING PUMP

4.3 Every dispensing pump shall be provided with an individual sales indicator graduated to indicate all possible deliveries of one litre and above. Any other counting or totalising device that may be provided, shall be so arranged as to avoid any possibility of confusion with the individual sales indicator.

4.4 A dispensing pump of the meter type shall be so constructed that, after a particular delivery cycle has been completed by movement of the

starting lever to its shut off position, an effective automatic interlock shall prevent a subsequent delivery being started until the indicating elements have been returned to their correct zero position.

4.4.1 A dispensing pump of the container type shall be so constructed that the individual sales indicator shall register only when the discharge from each container has commenced. A notice shall be prominently exhibited on the pump panel to indicate clearly and prominently the following:

PLEASE ENSURE BEFORE STARTING DELIVERY

- a) Sales indicator is set at zero
- b) Container is full.

4.5 Dispensing pumps of the container type shall be provided with observation windows or other means for showing clearly that the container or containers are properly charged and discharged.

4.6 Dispensing pumps delivering fuel under pressure shall work on the 'Wet-Hose' system, and shall be fitted with a nozzle having combination-control valve and automatic pressure discharge valve which shall operate under the pressure at which the pump is designed to deliver.

4.6.1 Dispensing pumps delivering fuel under gravity shall work on the 'Dry-Hose' system. The 'Dry-Hose' shall be of such length and stiffness as to facilitate complete and rapid drainage of the hose pipe and shall be provided with a nozzle without any valve.

4.6.2 The length of the discharge hose on a dispensing pump shall not exceed 5 m measured from the outside of the housing of the pump to the inlet end of the discharge nozzle.

4.7 Dispensing pumps of the meter type may be fitted with a suitable sight glass.

4.7.1 Where a dispensing pump is provided with a swing arm or rigid form extension pipe, such arm or pipe shall be so constructed as to remain permanently full up to its connection to the flexible hose, and the sight glass, if provided, immediately before the connection to the flexible hose.

4.8 A dispensing pump of the meter type shall have an air eliminator unit situated between the pumping unit and the metering unit.

4.8.1 A dispensing pump of the container type shall have a suitable air vent to preclude the possibilities of air-trap in the volumetric container.

4.9 The metering unit of a meter type dispensing pump shall have a suitable device for adjusting the errors caused by wear and tear of the moving parts of the meter. This device should provide adjustment for errors within the prescribed tolerances.

4.9.1 The volumetric container of a container type dispensing pump shall have a suitable device to compensate for the error caused during the manufacture of the container or assembly of the container unit.

4.9.2 The device mentioned in 4.9 and 4.9.1 should be provided with a sealing arrangement.

5. TESTS

5.1 All dispensing pumps shall be tested for accuracy of discharge as described hereunder.

5.1.1 A dispensing pump shall be tested under practical working conditions with the liquid that the instrument is intended to deliver.

5.1.2 Before commencing the checking of a dispensing pump, the pump shall be run for a few minutes to ensure that all the units are functioning smoothly and also the discharge hose has been wetted.

5.1.3 A dispensing pump, before being tested for accuracy, shall be tested for leakage by being first fully primed.

5.1.4 For checking dispensing pumps, a test measure calibrated to the accuracy of a working standard shall be used.

5.2 The procedure for testing dispensing pumps shall be as follows:

- a) The test measure shall first be filled to its full capacity in order to wet all inside surfaces. It shall then be emptied and drained by up-ending it for 10 or 15 seconds.
- b) The pointer (meter type) or reading (container type) of the recording mechanism shall then be set to zero.
- c) The pump shall be operated to dispense into the test measure a quantity of liquid equivalent to the capacity of the test measure as registered on the pump. In the case of container type pumps the capacity of the test measure should correspond to the capacity of the container.
- d) A pump shall be deemed to be correct if it gives correct results in two consecutive tests.
- e) The tests shall be repeated until the pump gives two consecutive deliveries within the permissible error.

5.3 Every dispensing pump shall deliver correctly within the permissible errors specified in 5.4 when the pump is discharging at a rate between 15 litres per minute and the maximum rate of discharge.

5.4 The permissible errors shall not exceed the limits specified below:

<i>Quantities Delivered</i>	<i>Maximum Permissible Error in Excess Only</i>
litres	
5	15 ml
above 5	0.25 percent

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